COLORADO RIVER RECOVERY PROGRAM **Project No.: 144**
FY - 2006 - 2007 PROPOSED SCOPE-OF-WORK for:

Native fish response in the middle Green River, Utah

Lead Agency: Utah Division of Wildlife Resources
Principal Investigators:

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Category:
___Ongoing project
_X Ongoing-revised project
___Requested new project
___ Unsolicited proposal

Expected Funding Source:
X Annual funds
___ Capital funds
___ Other (explain)

I. Title of Proposal:

Native fish response to nonnative fish control in the middle Green River, Utah.

II. Relationship to RIPRAP:

Green River Action Plan: Mainstem

III. Reduce negative impacts of nonnative fishes and sportfish management activities (Nonnative and sportfish management)

III.A.2.c Evaluate the effectiveness (e.g., nonnative and native fish response) and develop and implement an integrated, viable active control program.

III. Study Background/Rationale and Hypotheses:

Control actions targeting nonnative gamefish species are being evaluated across the Upper Basin to determine the level of reduction in abundance of these species necessary to minimize the threat to the recovery of the endangered Colorado River fishes. There are two key aspects to evaluating control of nonnative fishes: (1) can the abundance of the target species be reduced significantly by the approaches employed, and (2) is there a measurable positive response by populations of the endangered fish species and associated native fish community?

Given the preliminary stage of nonnative fish control evaluations and the confinement to select river reaches, the most likely first observed positive response will be evident in early life-stages of the native fish community (e.g. flannelmouth and bluehead sucker, roundtail chub and speckled dace). Adult response will not be observed for several years following any significant removal. Also a response may not be observed because of the large ranging area of adults. A positive response in endangered fish species may be more difficult to measure statistically without a longer time frame for observation due to generation times within endangered fish populations. Data necessary for these analyses will be generated by current and future young-of-year sampling and population estimation projects for these endangered species in conjunction with nonnative fish removal efforts.

This project will focus on determining a response of early life-stages of native and small-bodied fish to removal of nonnative predators; primarily smallmouth bass and northern pike. These fish will serve as indicators of the response that would be experienced by endangered fish species occupying the same habitat types.

IV. Goals, Objectives, End Product:

Goal: A reliable estimate of native fish response to an estimated level of nonnative predator removal.

Objectives:

1) Implement removal of northern pike from Island Park to the confluence of the White River and smallmouth bass from Split Mountain to Sand Wash. *This objective will be implemented under the projects: Northern pike control in the middle Green River (Project # 109) and smallmouth bass control in the Green River (Project # 123).*

2) Assess abundance of northern pike and smallmouth bass in the middle Green River to determine removal effect.

3) Estimate response of small-bodied and early life-stage native fish to removal of northern pike and smallmouth bass.

End Product:
RIP Annual reports: Nov. 2006 - 2007
Draft final report to Project Coordinator 31 May 2008, peer and Biology Committee 30 June and final to Biology Committee 15 August 2008.

V. Study area:

Middle Green River (Split Mountain to Sand Wash): RM 318 - RM 215

VI. Study Methods/Approach:

Objective 1.
Implement removal of northern pike from Island Park to Sand Wash and smallmouth bass from Split Mountain to Sand Wash.

Removal of northern pike in the middle Green River began in the spring of 2001 in the middle Green River in the reach of river from Island Park to Sand Wash (Project # 109). Smallmouth bass removal was initiated in early June 2004 beginning at Split Mountain to Sand Wash (Project # 123).

Objective 2.
Assess abundance of northern pike and smallmouth bass in the middle Green River to determine removal effect.

Currently, all northern pike captured from Island Park to Sand Wash are removed. Since the initiation of northern pike removal in the middle Green River in 2001, catch rates have declined substantially. In 2001, 248 northern pike were removed from the middle Green River and with approximately the same effort, in 2004 only 27 were captured and removed. Catch-per-effort and a depletion will be used to estimate annual abundance of northern pike in the middle Green River. Capture-recapture abundance estimates will be generated for smallmouth bass each year by completing one tagging pass and three removal passes from Split Mountain (RM 318) to Sand Wash (RM 215). This will be repeated in subsequent years and will allow a determination of removal effect. Removal of northern pike will also continue.

Objective 3.
Estimate response of small bodied native fish to removal of northern pike and smallmouth bass in the middle Green River.

Sampling to evaluate a response of small bodied native fish to nonnative predator removal will be conducted by seining suitable low-flow and backwater habitats. Three low-velocity habitats will be sampled every five miles dependant on the number of these habits available within the reach. Currently, the first two backwaters encountered in each 5-mile subreach are sampled under project # 138; YOY Colorado pikeminnow monitoring. Sampled backwaters will be blocked at the mouth using a large small mesh seine to allow for closed sampling and a better evaluation of fish species composition and densities. This will also facilitate depletion sampling for abundance estimation.

Backwater/low velocity habitats will be sampled using a 1.2 m x 4 m seine with 3 mm mesh. At least two non-overlapping seine hauls will be conducted in each habitat sampled. Preferably the two seine hauls will be parallel to one another and perpendicular to the axis of the backwater. However, if water depth is too great, a haul will be completed along one shoreline. The first two seine hauls will be taken at 1/3 and 2/3 the distance from the mouth of the backwater. Additional seine hauls may be completed in any portion of the habitat including the mouth or shallow tail of a backwater. Length of each seine haul, maximum depth, and average depth will be recorded for each sample. All

endangered and native fish will be identified, total length measured (mm), and returned alive to the habitat. Ray counts will be completed for all chubs (*Gila* spp.) captured. All nonnative fishes will be enumerated and returned to the backwater or low-flow habitat.

Task Description and Schedule (FY2006-2008)

Task 1. Prepare sampling equipment and scout sample sites. Sept. 2006 - 2007.

Task 2. Small-bodied fish sampling. Sept. - Oct. 2006 - 2007

Task 3. Data entry and analysis.

Database development and management - Fall 2006-2007
Data analysis - Winter 2006-2007

Task 4. Annual reporting

RIP Annual report - November 2006 - 2007

Task 5. Final reporting

Draft final report to recovery program coordinator - May 31, 2008
Draft final report to peer reviewers and Biology Committee - June 30, 2008
Final report to Biology Committee - August 15, 2008

FY2006 Work

- Deliverables and due dates: Annual Report November 2006
- Budget:

Task 1. Prepare sampling equipment and scout sample sites. *This task overlaps with work currently being done by UDWR - Vernal for Task 1 of Project #138 YOY Colorado pikeminnow monitoring.*

Labor-	Work days	Cost
Project Leader (438/day)	3	$1,314
Biologist (340/day)	3	$1,020
Technician (195/day)	5	$975
Travel ($38/day/vehicle)[a]	3	$114
Materials		$500
Equipment (maintenance)[b]		$500
Other		$200
FY06 Task 1 Subtotal		$4,623

[a] Calculated as average miles traveled per day * cost per mile + daily rental fee = 80 * $0.41 + $5 = $37.80/day.

[b] Includes repair or replacement of outboard motor lower units, electrofishing, fyke net and trammel net repair and replacement.

Task 2. Small-bodied fish depletion sampling. *This task overlaps with work currently being done by UDWR - Vernal for Task 1 of Project #138 YOY Colorado pikeminnow monitoring.*

Labor-	Work days	Cost
Project Leader (438/day)	10	$4,380
Biologist (340/day)	20	$6,800
Technician (195/day)	30	$5,850
Travel ($38/day/vehicle)	15	$570
Materials		$500
Equipment (maintenance)		$350
Other		
FY06 Task 2 Subtotal		$18,450

Task 3 and 4. Data entry, analysis and annual reporting. *This task overlaps with work currently being done by UDWR - Vernal for Task 2 of Project #138 YOY Colorado pikeminnow monitoring.*

Labor-	Work days	Cost
Project Leader (438/day)	5	$2,190
Biologist (340/day)	15	$5,100
Technician (195/day)	10	$1,950
Travel ($38/day/vehicle)		
Materials		
Equipment (maintenance)		
Other		
FY06 Task 3&4 Subtotal		$9,240

Task 5. Final reporting.

Labor-	Work days	Cost
Project Leader (438/day)	0	$0
Biologist (340/day)	0	$0
Technician (195/day)	0	$0
Travel ($38/day/vehicle)		
Materials		
Equipment (maintenance)		
Other		
FY 06 Task 5 Subtotal		$0

FY 2006 Total	$32,313

FY 2007 Work

- Deliverables and due dates: Annual Report November 2007
- Budget:

Task 1. Prepare sampling equipment and scout sample sites. *This task overlaps with work currently being done by UDWR - Vernal for Task 1 of Project #138 YOY Colorado pikeminnow monitoring.*

Labor-	Work days	Cost
Project Leader (451/day)	3	$1,353
Biologist (350/day)	3	$1,050
Technician (201/day)	5	$1,005
Travel ($38/day/vehicle)	3	$114
Materials		$500
Equipment (maintenance)		$500
Other		$200
FY07 Task 1 Subtotal		$4,722

Task 2. Small-bodied fish depletion sampling. *This task overlaps with work currently being done by UDWR - Vernal for Task 1 of Project #138 YOY Colorado pikeminnow monitoring.*

Labor-	Work days	Cost
Project Leader (451/day)	10	$4,510
Biologist (350/day)	20	$7,000
Technician (201/day)	30	$6,030
Travel ($38/day/vehicle)	15	$570
Materials		$500
Equipment (maintenance)		$350
Other		
FY07 Task 2 Subtotal		$18,960

Task 3 and 4. Data entry, analysis and annual reporting. *This task overlaps with work currently being done by UDWR - Vernal for Task 2 of Project #138 YOY Colorado pikeminnow monitoring.*

Labor-	Work days	Cost
Project Leader (451/day)	5	$2,255
Biologist (350/day)	15	$5,250
Technician (201/day)	10	$2,010
Travel ($38/day/vehicle)		
Materials		
Equipment (maintenance)		
Other		
FY07 Task 3&4 Subtotal		$9,515

Task 5. Final reporting.

Labor-	Work days	Cost
Project Leader (451/day)	0	$0
Biologist (350/day)	0	$0
Technician (201/day)	0	$0
Travel ($38/day/vehicle)		
Materials		
Equipment (maintenance)		
Other		
FY 07 Task 5 Subtotal		$0

FY 2007 Total	$33,197

FY 2008 Work

- Deliverables and due dates:
  - Draft final report to recovery program coordinator - May 31, 2008
  - Draft final report to peer reviewers and Biology Committee - June 30, 2008
  - Final report to Biology Committee - August 15, 2008
- Budget: $12,000

IX. Program Budget Summary

FY 2006	$32,313
FY 2007	$33,197
FY 2008	$12,000
Project Total	$77,510

X. Reviewers